



# **NOAA Testbeds and Proving Grounds: An Integrated Approach**

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# Outline

- Background
- R2O/O2R Framework & Coordination
- Spring Workshop



# Background

NOAA operates a number of testbeds (TB) and operations and services proving grounds (PG), but lacked a systematic approach for their function, their mode of operation and reporting their results

Working definitions of TB/PG are provided in backup; briefly:

- TB-- for developmental testing
- PG-- for pre-deployment (experimental) testing of advanced operations, services and science and technology capabilities

At request of NWS LOTM, an ad hoc group of NWS and OAR representatives recommended guidelines for TB/PG, on:

- Roles and responsibilities
- Function and execution
- Governance

NOAA LOTMs approved guidelines and chartered a Coordinating Committee for TB/PG (March 2011) to facilitate R2O via more integrated testing



# Framework for R2O/O2R:

## Phased Implementation into NWS Operations

Phase	Key Q	Key Metric	Facility
R&D	Does it work?	Peer-reviewed Publication	Universities, Government Labs, Private Industry
Developmental Testing	Works with operational systems?	Feasibility/ Engineering Analysis Successful	Testbed with operations- like environment
Experimental Testing	Meets operational performance criteria?	Go/No Go based on: Objective Performance (e.g. accuracy) Subjective Feedback Production Readiness	Operational proving ground for clinical tests and full “dress rehearsal”
Operations	Maintains required performance?	Objective criteria: accuracy and reliability	Operations



# Guidelines Development

## **NOAA LOTMs approved the guidelines prepared by an ad hoc committee:**

NWS: Paula Davidson, Jason Tuell, Louis Uccellini

OAR: John Gaynor, Steve Koch, Roger Pierce, Marty Ralph

## **Followed guiding principles:**

- Policy Context:
  - NOAA and NWS Strategic Plans, NOAA Research Plans, S&T and Services Roadmaps, NOAA research/laboratory reviews, NOAA science review policy
  - Complementary activities by: LOTM, RITT, OSIP
- Function and execution-- incorporate best practices from current testbed and proving ground (TB/PG) charters and terms of reference
- Governance:
  - Promote consistency, but not uniformity, among testbeds and proving grounds
  - Involve appropriate stakeholders
  - Propose formal coordination among /across facilities



# Coordinating Committee

## Responsibilities

- Facilitates communication coordination and consistency among TB/PG
- Assists in programmatic evolution of TB/PGs
- Reports overall progress, success, issues to Line Office Transition Managers (annually)
- Links to NOAA budget planning and execution processes to ensure TB/PG are included; advocates for resources
- Educates/advocates on TB/PG within and external to NOAA

## Membership

- Each TB/PG manager (or designee)
- Line Office focal points for TB/PG, appointed by AAs or LOTMs



# First Steps: Coordinating Committee

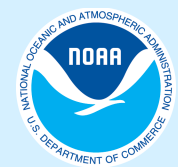
- Comprised of TB/PG managers and LOTM-designated LO focal points:
  - Co-chairs: Paula Davidson (NWS LO focal point) and John Gaynor (OAR LO focal point)
- Initial meeting (NWS and OAR members): Seattle AMS, Jan 2011
- Activities:
  - Quarterly meetings featuring TB/PG presentations on recent tests/results
  - Coordination/Outreach: coordinated FY12-FY18 SEE inputs, developing TB/PG Coordination website, preparing “NOAA Transitions 101”; one-on-one tutorials on guidelines
  - Web-site portal updates/revamp (special thanks to Rich Latatis & Barb deLuisi)
  - Organizing 3<sup>rd</sup> NOAA workshop on testbeds/proving grounds



# Spring 2012 Workshop

- 3rd in series; first to highlight opportunities for integrated testing in NOAA TB/PG
- Overviews from current/emerging TB/PG
- Integrating Science Theme: Intense Precipitation Events
- Additional highlights:
  - Updates on new/emerging TB/PG e.g. OPG, GSD decision support
  - Updates on related prototyping activities: e.g. SPoRT, C-STAR
  - Introduction to NWS Roadmap Pilots
- Discussion
  - Keys to increasing the effectiveness of NOAA transitions





# Backup



# Guidelines: Roles and Responsibilities

## NOAA participants

### Host facilities:

- Develop and maintain Charter and/or Terms of Reference (see governance)
- Establish and lead management team, to oversee, support and facilitate testing operations (see function/execution)
- Lead management team, establish executive oversight committee
- Participate in NOAA-wide coordinating TB/PG coordinating committee

### Research partners (outside host facility):

- Participate in peer-review and provide testing support

### Operations partners (outside host facility):

- Provide statement of needs/requirements and testing support

## External participants

- Respond to announcements of opportunities for testing advanced S&T to support NOAA's operational mission requirements
- Participate in testing and evaluation



# Guidelines: Testbed Functions

## Testbeds/testbed personnel, under local testbed management:

- Conduct controlled testing of peer-reviewed capabilities to determine if they can work with operational systems
- Provide announcements of opportunity for testing
- Prioritize tests through peer review recommendations, subject to oversight
- Assist/facilitate testing
- Report plans and results at least annually (Management Team)



# Guidelines: Proving Ground Functions

## Proving grounds personnel/local management function similarly to testbeds

- Conduct controlled real-time testing of capabilities proven to work with operational systems
  - Assess workflow, workload options and impacts; including collaborative operations
  - Determine operational readiness
- Provide announcements of opportunity that identify additional criteria for Proving Ground consideration: e.g. having passed testbed/developmental testing, and demonstrated impact on meeting operational requirements
- Prioritize testing
- Assist/facilitate testing and participate in review/approval processes for implementing into operations
- Report plans and results at least annually (management)



# Guidelines: Governance

## Major aspects

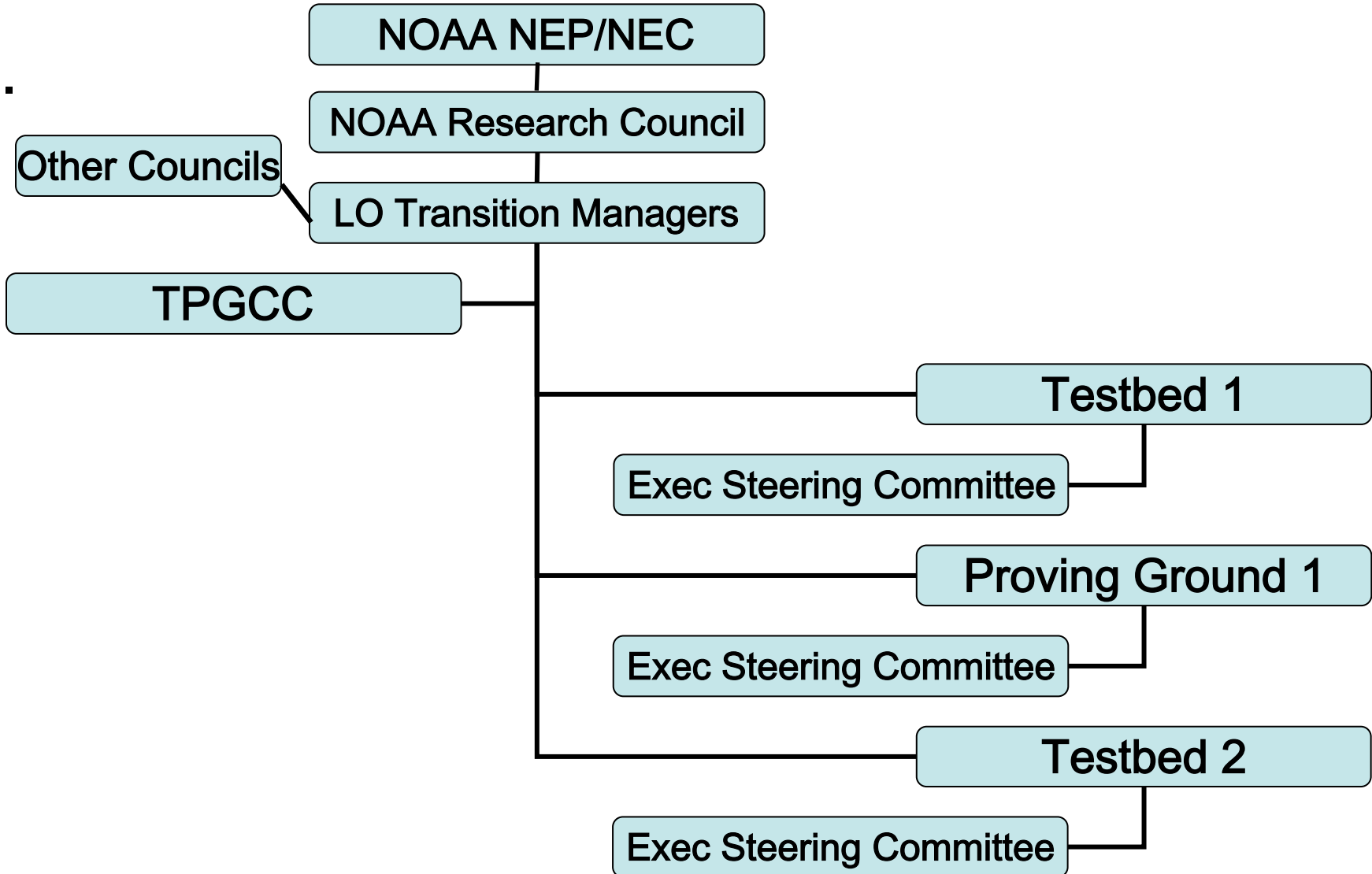
- Local management teams: conduct/support testing operations, report results
- Executive committees/boards: apply strategic and funding considerations in oversight/review of activities, selection of tests, and quality of results
- Coordinating Committee of TB/PG managers and LO focal points: facilitate communication and to provide coordination and consistency among TB/PG

## Charters/Terms of Reference: Each TB/PG should develop and maintain

- Outlines scope, operations, and governance, including general procedures, infrastructure requirements and availability of staff and other testing support
- Authority for charters should be the executive oversight committee, or its designee



# Governance





# Working Definitions: Testbed

## Testbed:

- A working relationship for developmental testing, in a quasi-operational framework among researchers and operational scientists/experts (such as measurement specialists, forecasters, IT specialists) including partners in academia, the private sector and government agencies, aimed at solving operational problems or enhancing operations, in the context of user needs.
- A successful testbed involves physical assets as well as substantial commitments and partnerships.

## What is tested?

- Advances to be considered include peer-reviewed candidates for more effective observing systems, better use of data in forecasts, improved forecast models, and applications for improved services and information with demonstrated economic/public safety benefits.



# Working Definitions: Proving Ground

## Operations and Services Proving Ground:

- A framework for NOAA/NWS to conduct testing of advanced operations, services and science and technology capabilities that address the needs of both internal and external users. Successful testing demonstrates readiness to implement into operations.

## What is tested?

- Capabilities that have already passed developmental testing. Such capabilities include advanced observing systems, better use of data in forecasts, improved forecast models, and applications for improved services and information with demonstrated economic/public safety benefits.